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Cont'd
27. (New) The operable window system of claim 11 wherein said axis is substantially vertical.
 28. (New) The operable window system of claim 11 wherein said axis is substantially horizontal.
 29. (New) The operable window system of claim 11 wherein said window system is non-rectangular.
 30. (New) The operable window system of claim 11 wherein the portion of said moving sash in contact with said removable screen is said frame portion of said moving sash.
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Remarks

Reconsideration and further examination is respectfully requested.

Claims 4 through 10 were last presented for examination. Pending claims 4 through 10 have been cancelled without prejudice. New claims 11 through 30 are presented for further examination.

In brief, the present invention relates to a new screen system for an operable window in which the screen is removably mounted using a hook and loop fastener system between a fixed frame and a moving sash. Further, the operable portion of the window is connected to said fixed frame and operable to substantially swing about an axis with respect to said fixed frame.

Claims 4 through 8 were rejected based on 35 USC 103 as being unpatentable over Dickerson et al in view of Panttila and Peterson III.

Claim 9 was rejected based on 35 USC 103 as being unpatentable over Dickerson et al in view of Panttila and Peterson III and further in view of Jones et al.

Claim 10 was rejected based on 35 USC 103 as being unpatentable over Dickerson et al in view of Panttila and Peterson III.

The Examiner asserts that the Dickerson et al patent shows a removable screen captured between a moving sash and a fixed frame. The Examiner further asserts Peterson III teaches of mounting the removable frame with a hook and loop fastener, and Panttila teaches that the removable portion does not require a rigid frame. The Examiner asserts that the combination renders the present invention obvious by 35 USC 103.

The Examiner further asserts that in the Response to Arguments, paragraph 1 in the Final Office Action, that “Dickerson et al (Figure 7B) teaches a screen mesh (202) being between the sash (201) and the fixed frame (2). Figure 7B thus clearly shows the additional claimed feature”, referring to the placement of the screen between a fixed frame and moving sash of the window.

Applicant respectfully directs the Examiner’s attention to Dickerson et al, column 9, lines 59 through 62: “Such a frame may be a simple steel banding 201 used to hold the screen or film material 202 as shown in FIG 7A. As shown in FIG 7B a decorative tape 203 may be used to cover the steel band.”

Applicant points out that Figure 7B, in view of Figures 2 and 7A, shows that the screen 202 may be captured between a magnet strip 14 and a steel banding 201 on a window frame 2, and that the steel banding 201 is not a moving window sash. In other words, Dickerson does not show a screen mounted between said fixed frame and said moving sash such that said moving sash is in contact with said removable screen. Rather, the disclosure of Dickerson merely shows another embodiment of his invention in which a screen is mounted on the opposite side of the fixed frame from the removable screen, not between the sash and the frame.

Applicant further points out that the references of Dickerson et al, Panttila, Peterson III, or Jones et al, taken alone or in combination do not teach all of the limitations of the claims as presented. Specifically, the limitations of a “removable screen mounted between said fixed frame and said moving sash” as well as “a moving sash connected to said fixed frame and operable to substantially swing about an axis with respect to said fixed frame.”

Filed herewith is a 37 CFR 1.132 Declaration of Dennis Johnson, an expert in the field of window systems. The facts set forth in Mr. Johnson’s declaration establish that Dickerson et al, Panttila, Peterson III, and Jones et al do not anticipate or render applicant’s invention obvious for the following reasons:

1. That, even if combinable, the references do not show all of the limitations of the present claimed invention.

2. That the references teach away from the limitations of the present claimed invention by teaching the placement of the screen on an interior or exterior fixed frame, not between a movable sash and a fixed frame.

Dickerson et al, Panttila, Peterson III, and Jones et al taken alone or combined with any of the other references would not establish a *prima facie* case of obviousness.

For these reasons, and in view of the above amendments, this application is now considered to be in condition for allowance and such action is earnestly solicited.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'William W. Cochran', is written over a horizontal line.

William W. Cochran

Reg. No. 26,652
The Law Offices of William W. Cochran, II
3555 Stanford Road, Suite 230
Ft. Collins, CO 80525
Phone: (970) 377-6363
Fax: (970) 207-1985

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FAX NO.

P. 02/05

**Declaration under 37 CFR 1.132**

I, Dennis K. Johnson, declare as follows:

1. That I am a consultant currently with the architectural and engineering consulting firm Rath, Rath, and Johnson for the past 2 years and a consultant with Wiss, Janney, Elstner, and Associates for 14 years prior, and have been a consultant for 16 years specializing in exterior wall systems and curtain wall systems, prior to that, for 10 years I managed the physical testing labs of Robert W. Hunt Company, including testing of exterior wall systems and windows;
2. That I received a bachelor's degree in Civil Engineering from the University of Illinois in 1968 and have attended many industry seminars, lectures, conferences and tradeshow sponsored by ASTM, AIA, AAMA and other organizations;
3. That I my relationship with Dave B. Lundahl consists solely of having witnessed and performed testing of window systems designed or manufactured by Dave B. Lundahl over a period of several years, with the last testing approximately in 1996.
4. That I have reviewed the amended claims and specification of application serial number 09/326,405 of Dave B. Lundahl entitled "Improved Window Screen System" that are attached hereto as Exhibits A and B (Lundahl application);
5. That I have reviewed United States Patent 4,409,758 of Albert Dickerson, et al. entitled "Perimeter Strip for Magnetically Attractable Extruded Plastic Window System" which is attached hereto as Exhibit C (Dickerson patent);
6. That I have reviewed United States Patent 4,068,428 of O. James Peterson, III entitled "Insulation Window" which is attached hereto as Exhibit D (Peterson III patent);
7. That I have reviewed United States Patent 4,909,004 of Gary E. Panttila entitled "Screen Apparatus" which is attached hereto as Exhibit E (Panttila patent);
8. That I have reviewed United States Patent 5,365,707 of Dale C. Jones, et al. entitled "Architectural Element for Attaching to a Structure" which is attached hereto as Exhibit F (Jones patent);
9. That the Lundahl application discloses a rotatably operable window system with a flexible screen removably attached with a hook and loop fastener that is squeezed between the movable portion (sash) of the window and the fixed portion;

10. That the claims of Lundahl recite "a moving sash connected to said fixed frame and operable to substantially swing about an axis with respect to said fixed frame from an open position to a closed position";

11. That the claims of Lundahl recite "said removable screen mounted between said fixed frame and said moving sash";

12. That in the Final Office Action, Paper No. 14, the Examiner stated in the "Response to Arguments" section, paragraph 1 that:

Dickerson et al (Figure 7B) teaches a screen mesh (202) being between the sash (201) and the fixed frame (2). Figure 7B thus clearly shows the additional claimed feature.

13. That in the Dickerson patent, column 9, lines 59 through 62 state:

Such a frame may be a simple steel banding 201 used to hold the screen or film material 202 as shown in FIG 7A. As shown in FIG 7B a decorative tape 203 may be used to cover the steel band.

14. That Figure 7B of Dickerson, in view of Figures 2 and 7A, shows a window or screen element 202 captured between a magnet 14 and a steel band 201 and not between "a sash (201) and a fixed frame (2)";

15. That the Examiner's assertion that item 201 is a moving sash is incorrect;

16. That item 201 is a steel banding that is magnetically holds the removable portion of the window;

17. That the Figure 7B of Dickerson does not disclose the limitation "said removable screen mounted between said fixed frame and said moving sash";

18. That even if combinable, the combination of references of Dickerson, Peterson III, and Panttila in light of Jones do not show all of the limitations of independent claim 11 of Lundahl, specifically the limitation "said removable screen mounted between said fixed frame and said moving sash" is not shown;

19. That the Dickerson patent discloses a removable screen embodiment held in a rigid frame that is magnetically attached on the opposite side of the fixed frame section of the window from the moving sash section;

20. That, as such, the removable screen embodiment of Dickerson is not "mounted between said fixed frame and said moving sash";

21. That the Peterson III patent discloses a rigid, removable window attached using hook and loop fasteners on the **opposite side** of the fixed frame section of the window from the moving sash section;
22. That, as such, the removable window of Peterson III is not **"mounted between said fixed frame and said moving sash"**;
23. That the Panttila patent discloses a removable screen embodiment wherein the screen is attached with hook and loop fasteners on the **opposite side** of the fixed frame section of the window from the moving sash section;
24. That, as such, the removable screen embodiment of Panttila is not **"mounted between said fixed frame and said moving sash"**;
25. That the Jones patent discloses a non-removable rigid cover of non-rectangular shape held with metal clips attached to the exterior of a fixed frame opening;
26. That, as such, the Jones patent does not disclose a removable cover **"mounted between said fixed frame and said moving sash"**;
27. That none of the references disclose or teach putting the "removable screen mounted between said fixed frame and said moving sash";
28. That by placing the removable portion of the window system on the opposite side of the moving sash or door, Dickerson, Peterson III, and Panttila teach away from placing the removable portion of the window system **"between said fixed frame and said moving sash"**;
29. That even if combinable, the combination of references of Dickerson, Peterson III, and Panttila in light of Jones do not show all of the limitations of independent claim 11 of Lundahl, specifically that the limitation "a moving sash connected to said fixed frame and operable to substantially swing about an axis with respect to said fixed frame from an open position to a closed position" is not shown;
30. That Dickerson and Peterson III are directed to double hung window systems wherein the moving portion of the window operates by **sliding along the plane** of the window;
31. That, as such, neither Dickerson or Peterson III does not disclose **"a moving sash connected to said fixed frame and operable to substantially swing about an axis with respect to said fixed frame from an open position to a closed position"**;

32. That Panttila describes a screen system for a garage door system, and typical garage door systems incorporate some sliding motion of at least a portion of the door against the fixed frame section of the opening;
33. That, as such, Panttila does not disclose "a moving sash connected to said fixed frame and operable to substantially swing about an axis with respect to said fixed frame from an open position to a closed position";
34. That none of the references disclose or teach the use of "a moving sash connected to said fixed frame and operable to substantially swing about an axis with respect to said fixed frame from an open position to a closed position";
35. That I further declare that all statements made herein are believed to be true, and that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing therefrom.

Executed this 22 day of August 2002.

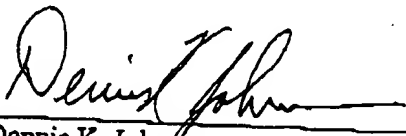

Dennis K. Johnson



EXHIBIT A

Attorney Docket No.: INOV01US01

CLAIMS

What is claimed is:

11. (New) An operable window system with a removable screen comprising:

a fixed frame;

a moving sash connected to said fixed frame and operable to substantially swing about an axis with respect to said fixed frame from an open position to a closed position; and

a removable screen removably connected to said fixed frame with hook and loop fasteners, said removable screen mounted between said fixed frame and said moving sash such that said moving sash is in contact with said removable screen when said moving sash is in said closed position such that said hook and loop fastener is engaged.

12. (New) The operable window system of claim 11 wherein said axis is substantially vertical.

13. (New) The operable window system of claim 11 wherein said axis is substantially horizontal.

14. (New) The operable window system of claim 11 wherein said window system is non-rectangular.

15. (New) The operable window system of claim 11 wherein the portion of said moving sash in contact with said removable screen is said frame portion of said moving sash.

16. (New) An operable window system with a removable screen comprising:

a fixed frame means for holding a window;

a moving sash means, connected to said fixed frame means, and operable to substantially swing about an axis with respect to said fixed frame means from an open position to a closed position; and

a removable screen means, removably connected to said fixed frame means with hook and loop fastening means, said removable screen means mounted between said fixed frame and said moving sash means such that said moving sash is in contact with said removable screen when said moving sash

is in said closed position such that said hook and loop fastener means is engaged.

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17. (New) The operable window system of claim 11 wherein said axis is substantially vertical.

18. (New) The operable window system of claim 11 wherein said axis is substantially horizontal.

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19. (New) The operable window system of claim 11 wherein said window system is non-rectangular.

20. (New) The operable window system of claim 11 wherein the portion of said moving sash in contact with said removable screen is said frame portion of said moving sash.

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21. (New) A method of manufacturing an operable window system comprising:
providing a fixed frame;

attaching a moving sash to said fixed frame in such a manner that said moving sash substantially rotates about an axis with respect to said fixed frame from an open position to a closed position; and

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attaching a removable screen to said fixed frame using a hook and loop fastener, such that said removable screen is mounted between said fixed frame and said moving sash such that said moving sash is in contact with said removable screen when said moving sash is in said closed position.

22. (New) The operable window system of claim 11 wherein said axis is substantially vertical.

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23. (New) The operable window system of claim 11 wherein said axis is substantially horizontal.

24. (New) The operable window system of claim 11 wherein said window system is non-rectangular.

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25. (New) The operable window system of claim 11 wherein the portion of said moving sash in contact with said removable screen is said frame portion of said moving sash.

26. (New) An operable window system manufactured by the process comprising:
providing a fixed frame;

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attaching a moving sash to said fixed frame in such a manner that said moving sash substantially rotates about an axis with respect to said fixed frame from an open position to a closed position; and

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attaching a removable screen to said fixed frame using a hook and loop fastener, such that said removable screen is mounted between said fixed frame and said moving sash such that said moving sash is in contact with said removable screen when said moving sash is in said closed position.

27. (New) The operable window system of claim 11 wherein said axis is substantially vertical.

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28. (New) The operable window system of claim 11 wherein said axis is substantially horizontal.

29. (New) The operable window system of claim 11 wherein said window system is non-rectangular.

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30. (New) The operable window system of claim 11 wherein the portion of said moving sash in contact with said removable screen is said frame portion of said moving sash.



EXHIBIT B

IMPROVED WINDOW SCREEN SYSTEM

Cross-Reference to Related Application

This application relates to and claims priority from my co-pending provisional application Serial No. 60/093,122, filed July 15, 1998.

Field of the Invention

This invention relates to window screens. More particularly, this invention relates to systems for attaching and securing screens to window frames.

Background of the Invention

Traditional window screens involve the use of a rigid frame (typically composed of metal) which extends around the periphery of the screen mesh and secures the screen mesh edges. This screen frame is then spring loaded in grooves in the window frame or mechanically connected or secured to the window frame to hold the screen in place.

The traditional system involves a number of disadvantages and inherent limitations. For example, the installation, removal and storage of conventional window screens frequently results in bent frames or damage to the screen mesh. Also, the required aluminum screen framing elements reduce the visual opening of a window. Further, some types of window frames do not have an appropriate

area to receive the normal metal framed screen or the window may not be rectangular in shape which renders the corner assembly or radius sections of the traditional metal screen frame problematic. Yet another disadvantage is that periodic maintenance may be required of the frame (i. e. painting, etc.).

U.S. Patent No. 4,249,589 describes apparatus for mounting an environment-controlling screen, sheet or membrane. However, separate frame sections are required and they must be secured to the inner periphery of an opening. This arrangement inherently reduces the size of the viewing opening. The system is surface-applied in a location exterior of all vertically operating window elements.

U.S. Patent No. 4,909,004 describes the use of a mesh screen for covering an opening in a structure (e.g. a garage). The screen is secured over the opening with VELCRO attachments, and a rain impervious sheeting is secured over the screen to increase the degree of enclosure of the structure in a selected amount and prevent wind and rain from passing through the screen.

U.S. Patent No. 5,193,602 describes a roll up canvas cover for window frames that utilizes VELCRO pads to secure the canvas covering in a rolled up position or in a fully extended closed position.

U.S. Patent No. 5,323,835 describes a removable screen for a car garage door. The top and sides of the screen are secured to the door casing with a VELCRO fastening system. A vertical zipper in the screen permits access into or out of the garage.

There has not heretofore been described a window screen system having the features and advantages provided by the present invention.

Summary of the Invention

In accordance with the present invention there is provided a frameless window screen system in which the screen mesh periphery has secured to it a strip of loop fastener material (i.e. VELCRO brand fastener material) and the corresponding window frame has secured to it a strip of the mating hook material. For example, the periphery of the screen or mesh may have secured to it a strip of the loop fastener material and the corresponding area of the window frame has secured to it a strip of the mating hook fastener material.

In order to affix the screen mesh to the window frame, the strip of fastener material on the outer edge of the mesh is aligned with and placed against the mating fastener strip which has been previously secured to a location on the window frame deemed most advantageous by the window designer. Each edge of the mesh includes a strip of the fastener material and each corresponding side of the window frame includes a strip of the mating fastener. Thus, each edge of the mesh can be stretched and then applied against the window frame, whereby the mesh is rendered taught and held tightly in place on the window frame regardless of its shape.

With the system of this invention, no separate rigid frame is required for the mesh or screen. Thus, the mesh can be easily removed for cleaning, transport or storage. The mesh can be easily rolled or folded and therefore it is much easier to work with than conventional metal framed screens. Also, there is no rigid frame to be potentially damaged (e.g. bent or scratched) or cause injury to the installer or damage to other materials in proximity to it. Maintenance associated with painting traditional metal framed screens is eliminated.

Another advantage of the system of this invention is that the frameless mesh or screen can be easily made for any size or shape of window opening (including non-rectangular openings, round, oval, etc.). It also enables screens to be made

in sizes that are too large for the common metal-framed screen to survive handling. It can also be used on windows which do not include a location for a traditional metal-framed screen.

Another significant advantage of the frameless window screen system is that it can be implemented without reduction of the size of the visual opening of the window. Further, a sagging mesh can be easily stretched taught again by pulling the mesh away from the window frame on one side, stretching it tightly and then reattaching it to the window frame.

Yet another advantage of the system is that the mesh can be more effectively sealed to the window frame at its edges than conventional metal framed screens, thereby preventing insects from entering into the room around the edges. The system of this invention also reduces manufacturer shipping and storage costs for new production windows or replacement screens.

Other advantages and features of the system of this invention will be apparent from the following detailed description and the accompanying drawings.

Brief Description of the Drawings

The invention is described in more detail hereinafter with reference to the accompanying drawings where like reference characters refer to the same parts throughout the several views and in which:

FIGURE 1 is an isometric exploded view illustrating a window frame, a screen mesh, and a window sash for either an in-swinging or out-swinging rectangular window.

FIGURE 2 illustrates the use of a screen system of this invention with a window frame having an in-swinging window sash.

FIGURE 3 illustrates the use of a screen system of this invention with a window frame and a common, crank controlled, out-swing window sash.

FIGURE 4 illustrates the use of a screen system of this invention on another type of window frame.

FIGURE 5 illustrates the use of a screen system of this invention in comparison with a common aluminum framed screen in a typical crank controlled out-swing window frame.

Detailed Description of the Invention

As illustrated in the drawings, the system of this invention involves (a) securing a first strip of fastener material to the outer edges of a screen mesh and (b) securing a second strip of mating fastener material to the edges of a corresponding window frame.

In Figure 1, the edges of screen mesh 10 have adhered thereto (e.g. with adhesive or with stitching) continuous strips of fastener material 11. The window frame 13 has adhered thereto a continuous strip of mating fastener material 12. Thus, whenever the window sash 14 is open, each edge of the screen mesh can be stretched and applied to (i.e. simply pushed against) a corresponding edge of the window frame, whereupon the mesh becomes affixed to the window frame.

Figure 2 illustrates a window having fixed frame section 15 and movable in-swinging window sash section 16. A strip 12 of fastener material is secured to the fixed window frame section 15 as shown. The mating strip 11 of fastener material on the edge of the screen mesh can be simply applied to strip 12 to secure it in place without taking up problematic amounts of space with traditional screen frames.

Figure 3 illustrates another type of window in which the system of the invention may also be used. The fastener strip 12 is secured to window frame section 18A which is the crank housing portion of frame section 18. The screen mesh 10 (with strip 11 on its edge) can be stretched into place and mated with strip 12. The window sash section 17 is moved open or closed through traditional action of the crank hardware assembly 30 without interfering with the screen mesh.

Figure 4 illustrates use of the screen mesh system on another type of window frame 20. Strip 12 is secured to window frame component 20 at an appropriate location out of view so as to mate with the strip 11 on the edge of mesh 10 without interfering with the electric motor mechanisms mounted in location 22 that operate the window sash section 21.

Figure 5 illustrates how the system of the invention provides for strip 11 on the screen mesh and strip 12 on the window frame section 18A to be located outside of the window's visual opening compared to that visual opening resulting from a traditional metal frame screen 19, provided for reference purposes only, in its most common usage location.

Other variants are possible without departing from the scope of the present invention. For example, the strip 11 can be placed on each face of mesh, if

desired. This enables the mesh to be reversed on the window frame for any reason. The system of this invention can also be used on various other types of frames besides those shown in the drawings.

Although it is preferred for the strip of fastener along each edge of the mesh to be a continuous strip, it is possible to use several shorter strips along each edge if that was desired. Also, the width of each fastener strip may vary, as desired. The fastener materials used in this invention are conventional hook and loop fasteners (e.g. VELCRO brand fasteners or other similar hook and loop fasteners which are commercially available.

What is claimed is:

1. A frameless window screen system for use in combination with a conventional window frame, the system comprising:

- (a) a screen mesh having side edges;
- (b) a first fastener strip secured to said edges of said screen mesh;
- (c) a second fastener strip secured to said window frame;

wherein said edges of said screen mesh can be aligned with said window frame in a manner that said first fastener strip mates with said second fastener strip to detachably secure said screen mesh to said window frame; wherein said first and second fastener strips comprise hook and loop fasteners.

2. The system in accordance with claim 1, wherein said screen mesh is rectangular.

3. The system in accordance with claim 1, wherein said screen mesh is non-rectangular.

4. A combination comprising:

- (a) a window frame defining an opening;
- (b) a screen mesh having a size and shape approximately equal to said opening; said mesh having side edges;
- (c) a first fastener strip secured to said side edges of said screen mesh;

(d) a second fastener strip secured directly to said frame around said opening;

wherein said first and second fastener strips comprise hook and loop fasteners; and wherein said side edges of said screen mesh are aligned with said frame around said opening; and wherein said first fastener strip is detachably secured to said second fastener strip, whereby said screen mesh covers said opening.

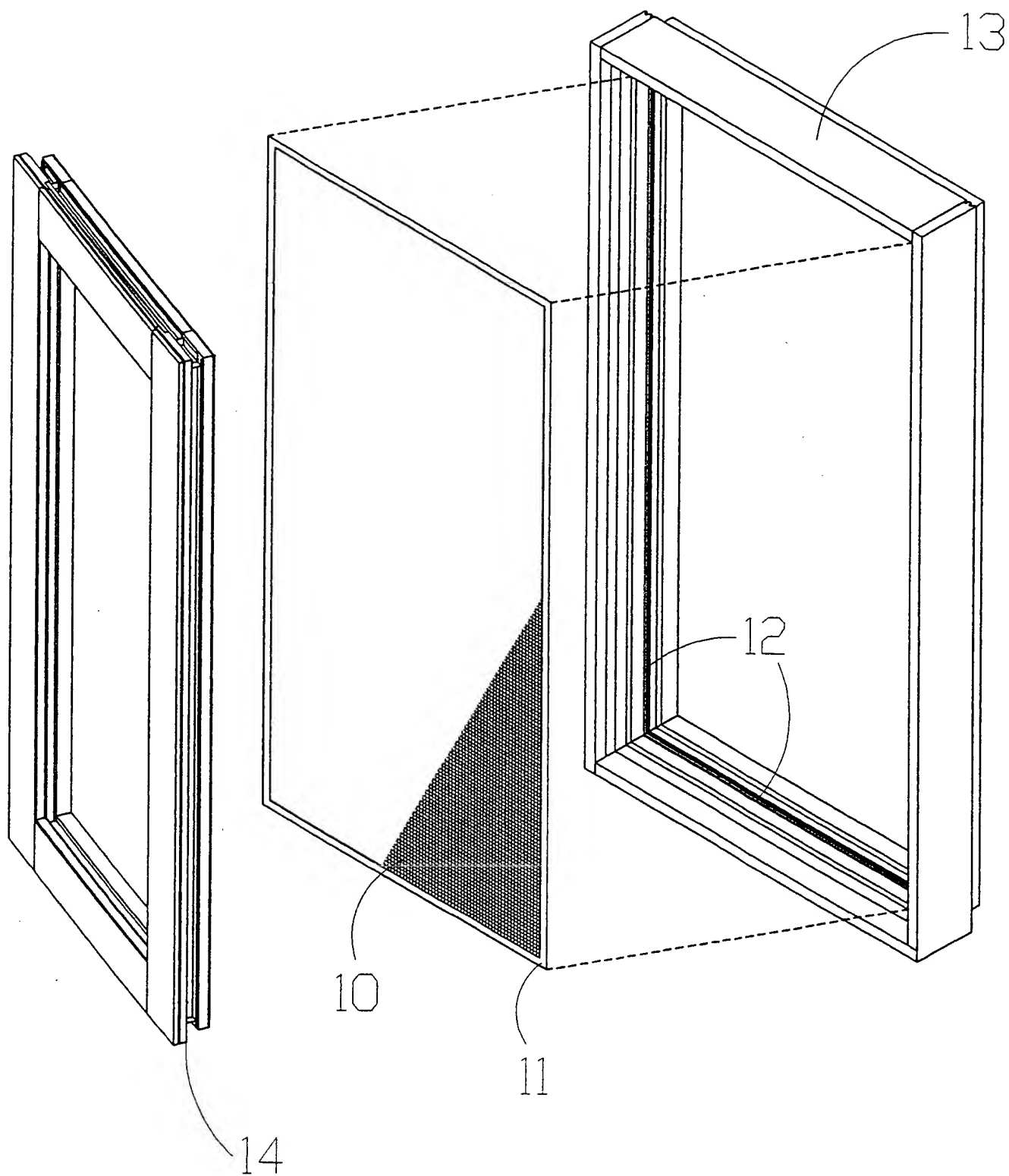


Fig. 1

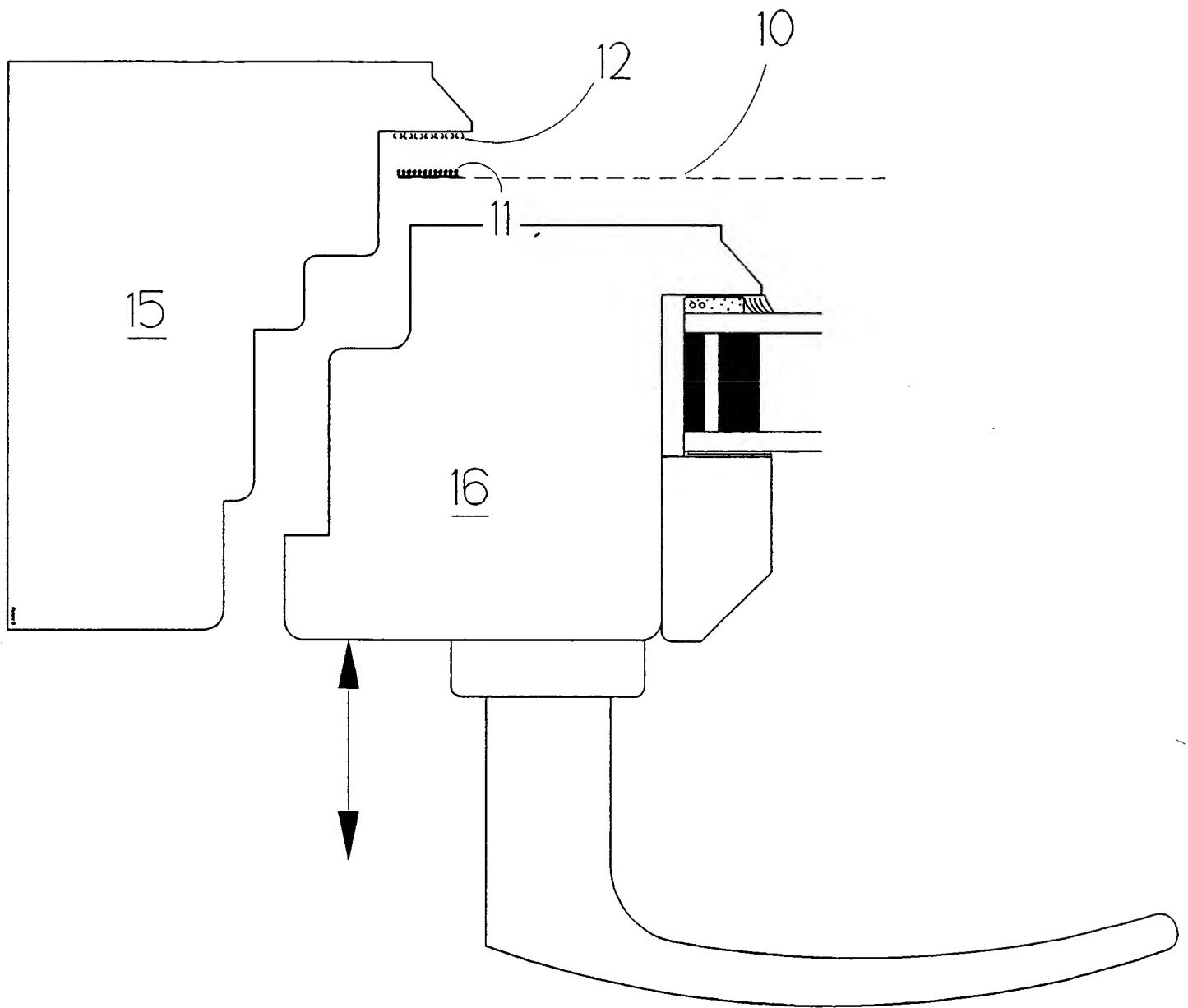


Fig. 2

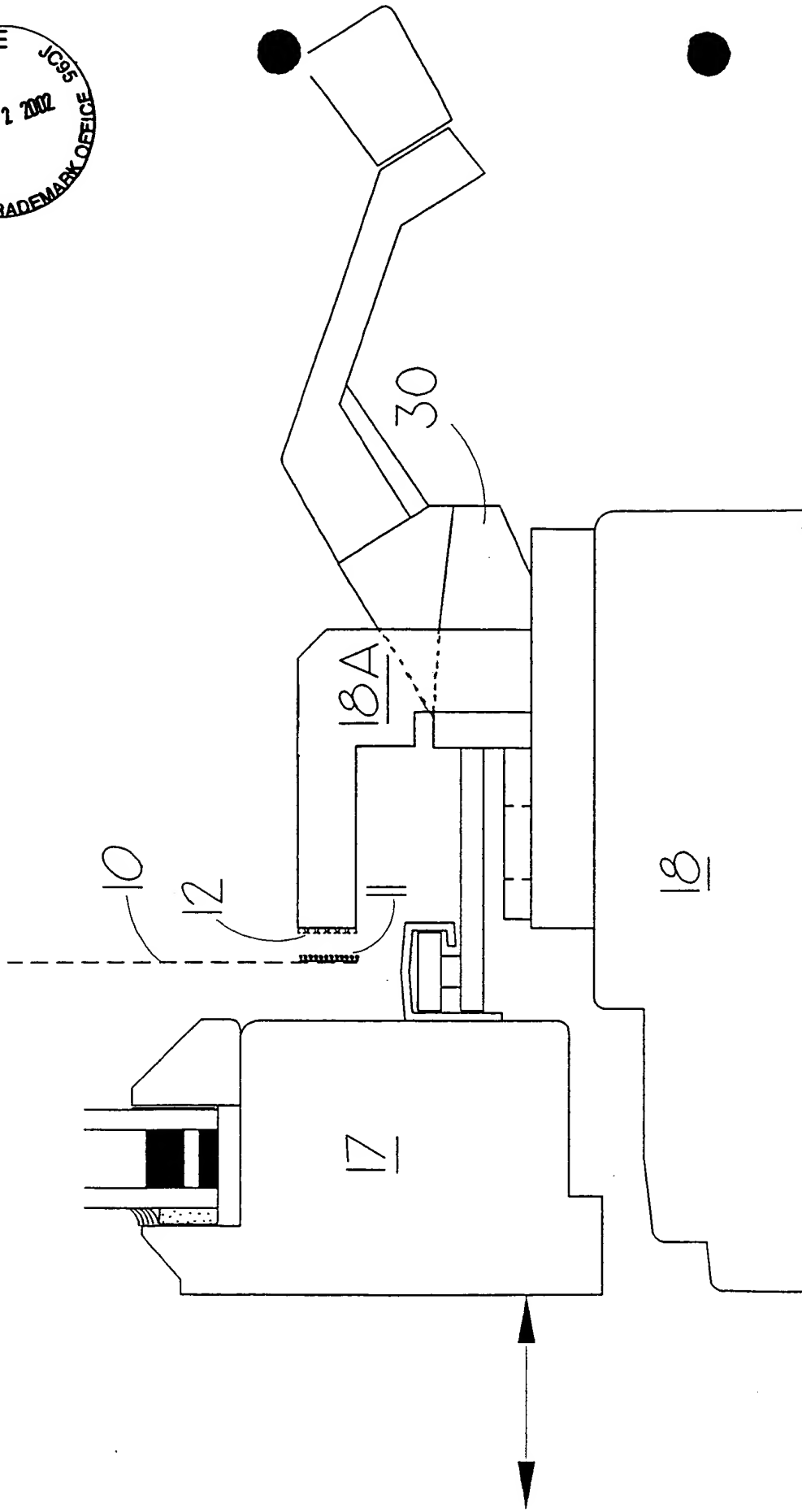


Fig. 3

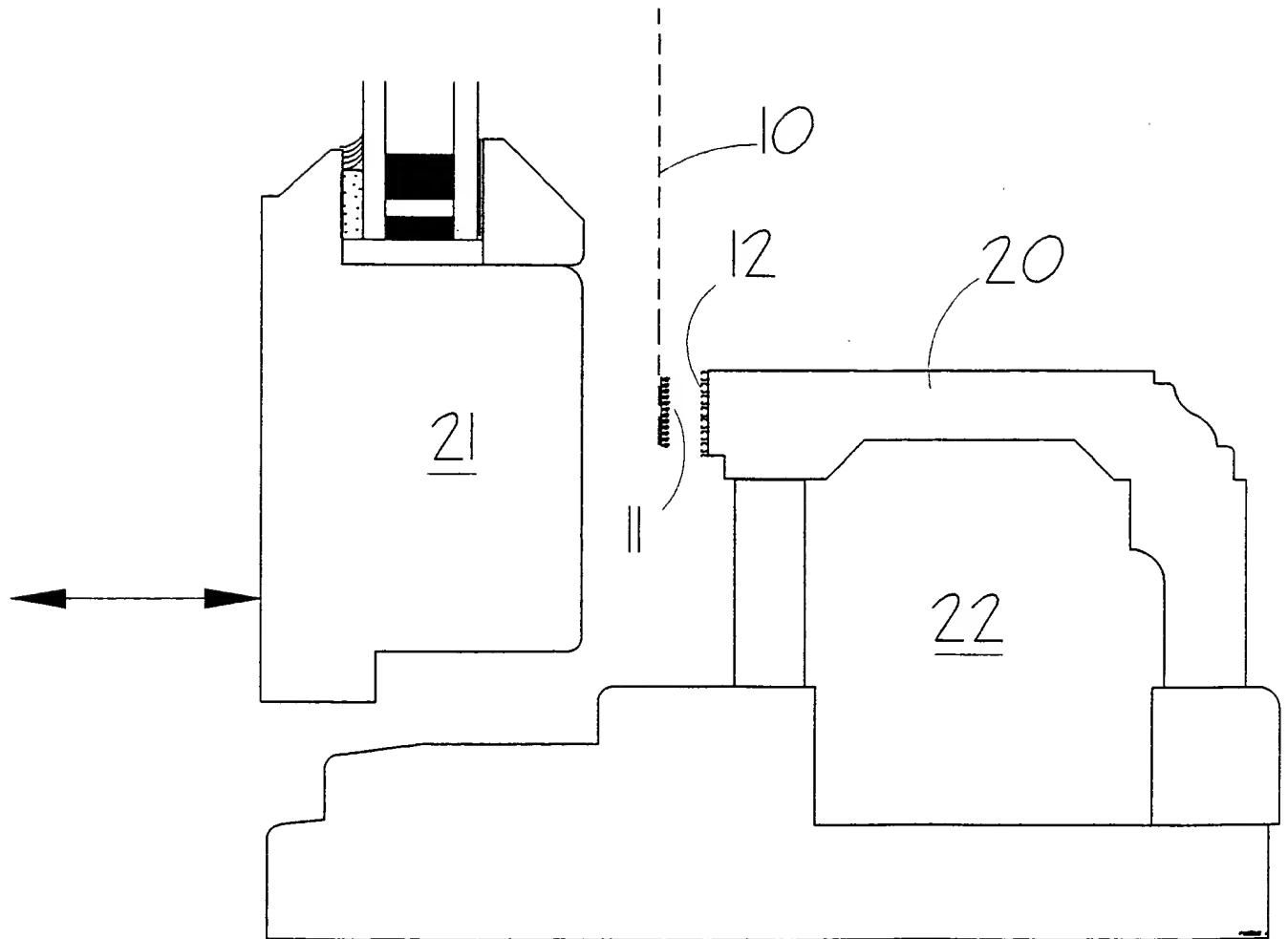


Fig. 4

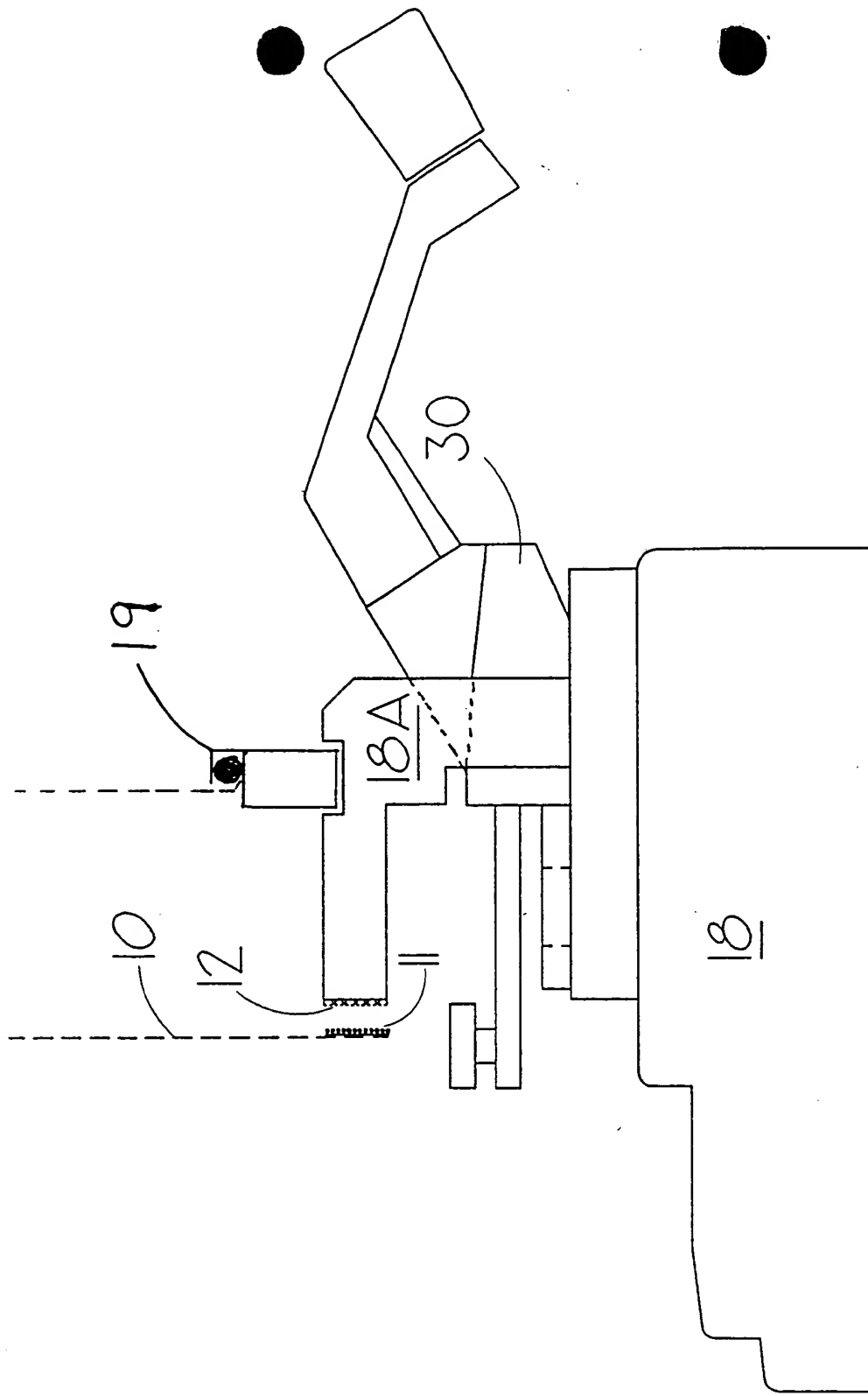


Fig. 5